An Overview of the Mars Reconnaissance Orbiter Mission

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The Mars Reconnaissance Orbiter (MRO) mission is a vital link in the overall Mars Exploration Program. Launched in August 2005, it will deliver a spacecraft to Mars orbit which will conduct both remote sensing science observations and site characterization for future potential landers, and provide critical telecom/navigation relay capability for follow-on missions. The mission is designed to provide both global and targeted observation from a low Mars orbit of 200 by 400 km with a 3:00 pm local solar mean time.

Launched by an intermediate-class launch vehicle from Kennedy Space Center (KSC), the prime science mission will observe the planet for one Martian year (approximately two Earth years), and will thereafter provide telecommunications support for spacecraft arriving from the 2007 and 2009 launch opportunities.

The reference science payload for the mission consists of a high resolution imager (capable of resolving 30 cm/pixel from the 200 km altitude), an imaging spectrometer, an atmospheric sounder and a context imager. These specific instruments and other investigations are being solicited competitively during 2001. The engineering payload consists of the telecommunications package, which provides the proximity link to the surface and approach navigation support, and an optical navigation camera, which prototypes precision entry navigation capability for future landers.

New approaches to the processing and archiving of the data set will be required due to the fact that the MRO data rate is approximately 25 times over that of the Mars Global Surveyor spacecraft.

The paper discusses the mission and science objectives, describes the mission design, the instrument complement, and the proposed ground data system.